

scraped from other streets nearby, though it was not possible to learn more definitely of the places from which the material had been taken. A hundred and more feet away from the plant, a gulley was being filled with discarded packing cases, automobiles and other matter; no plants were seen in that section.

The plant mentioned was flowering abundantly and producing seed.

In the season of 1930, about a dozen of the plants reached maturity within an eight-foot circle of the original plant, but none were found farther away. These flowered profusely and bore seed.

This plant seems to require a long season, not flowering until late summer or early fall. On November 15 it was observed that many seeds had matured, yet many capsules contained unripe seeds, and the fleshy leaves had been withered by the freezing nights of the first week of the month. The large, shining dark brown seeds (two in number) would seem likely to offer choice morsels to seed-eating birds.

The success or failure of this pioneer, in its attempt to establish itself in this region will be watched with interest for the next few years.
—ARTHUR H. NORTON, Portland Society of Natural History.

THE GENUS *GEUM* IN THE ATHABASCA-GREAT SLAVE LAKE REGION¹

HUGH M. RAUP

RECENT botanical surveys in the Athabasca-Great Slave Lake district have yielded a number of specimens of *Geum* which are not determined easily, and which seem to warrant a somewhat critical examination of the genus as it is there represented. The writer's collections may be divided into three groups, the two smaller of which are clearly *G. strictum* Ait. and *G. triflorum* Pursh. The largest group, involving 18 numbers and 58 sheets, is equally well-defined, but consists of plants with their upper stem-leaves considerably reduced and their basal leaves supplied with a large, ovate to cordate terminal leaflet after the manner of *G. macrophyllum*. Further characteristics of these plants are pale yellow obovate petals, receptacles loosely covered with very short hairs but not covered so as to obscure the rather elongated pits, the lower internodes of the styles loosely supplied with

¹ Published by permission of the Director of the National Museum of Canada, and during the writer's tenure of a National Research Fellowship in the Biological Sciences.

minute stalked glands, and the calyces and peduncles of the flowers and fruits with small stalked glands interspersed among the abundant short hairs. The plants are most common on meadow shores of lakes and streams and in upland semi-open prairies.

The specimens in question match closely in all of the above characters those in the Gray Herbarium labeled by Rydberg *G. oregonense* (Scheutz) Rydb., and also the type and several characteristic specimens of *G. perincisum* Rydb. loaned to the writer from the Herbarium of the New York Botanical Garden. After study of his own material and that just mentioned the writer has been unable to separate these two species. The serration of the leaflets and the shape ("rounded or reniform" vs. "rhombic, ovate, or subcordate") of the terminal leaflet of the basal leaves, used by Dr. Rydberg¹ as definitive characters do not appear reliable, especially in a group where leaf form is so notably variable.

The name *oregonense* was first used by Scheutz² in naming a fragmentary specimen from the Oregon region of North America. He considered it a subspecies of *G. urbanum* L., a European species which is now known to occur only as an introduction in eastern North America. Rydberg³ assumed this fragment to be identical with some of his undetermined northwestern specimens and accordingly named them *G. oregonense*. Since the specimen cited by Scheutz consists of only the upper parts of the stems and has no mature fruits, some character other than those commonly used became necessary before it could be adequately separated from its near affinities. Rydberg⁴ uses for this the shape of the upper stem leaves and the form of the inflorescence, neither of which appears to suffice in the material at hand. The tendency toward reduction and increased dissection of the upper stem leaves may be found in typical eastern *G. macrophyllum*, especially in specimens from the northern parts of the range. The form of the inflorescence is also extremely variable in typical *G. macrophyllum*, depending upon the age of the plant and its habitat. In all of the material, however, the presence of minute stalked glands on the peduncles has served to separate the specimens in question from *G. macrophyllum* which is without such glands. Dr. Gunnar Samuelsson, at Stockholm, has very kindly examined the original specimen cited

¹ Rydberg, P. A. *North American Flora* xxii. 402 (1913).

² Scheutz, N. J. *Prodr. Monogr. Georum* 26 (1870).

³ Rydberg, P. A. *Bull. Torr. Bot. Club* xxv. 56 (1898).

⁴ Rydberg, P. A. *North American Flora* xxii. 401 (1913).

by Scheutz, and states that the sheet contains four flowering tops, one with young fruits, collected by Captain Waerngren. He also compared it with two specimens apparently corresponding to *G. oregonense* Rydberg. The latter showed very prominent stalked glands, while on the Waerngren specimen these were completely lacking. Dr. Samuelsson states that the fragments are not from *G. strictum* and expresses the opinion that they are from *G. macrophyllum*.

The type-specimen of *G. perincisum* Rydb.¹ was collected by W. C. McCalla at Banff, Alberta, and as stated above matches the writer's material as well as that labeled *G. oregonense*. The question whether *perincisum* constitutes a species, however, requires further analysis before the name may be properly applied.

When compared with typical specimens of the two related wide-ranging species of the continent, *G. macrophyllum* and *G. strictum*, the close resemblance in essential characters between *G. perincisum* and *G. macrophyllum* is very marked. The receptacles of the fruiting heads, covered with very short hairs and having a distinctive arrangement of the pits, are scarcely distinguishable in the last two categories, while in *G. strictum* the receptacle is so covered with longer hairs as to obscure the pits. The lower internodes of the styles in the young and mature fruits of both *perincisum* and *macrophyllum* are supplied with minute stalked glands which are entirely absent in *G. strictum*. The general form of the basal leaves in *perincisum* strongly resembles that in *macrophyllum* in having a prominent terminal leaflet of rounded outline, and reduced lateral leaflets. It should be noted further that the major differences by which the two are separated are rather variable in themselves, and are in characters which are notable for their instability in this genus.² The deeper lobing in the terminal leaflet of the basal leaves, the reduction of the upper stem leaves, the glandularity of the peduncles, and a tendency toward lack of hairs on the faces of the achenes are the characters in *G. perincisum* which distinguish it from *G. macrophyllum*.

The geographic ranges of the two forms are also significant. Material in the Gray Herbarium and in the Herbarium of the New England Botanical Club has been used to supplement the writer's own and that obtained from the New York Botanical Garden to form the accompanying maps (Figs. 1 and 2).³ *G. macrophyllum*, originally

¹ Rydberg, P. A. *North American Flora* xxii. 405 (1913).

² Fernald, M. L. and Weatherby, C. A. *Varieties of Geum canadense*, RHODORA xxiv. 47 (1922).

³ Base map by J. Paul Goode, published by the Univ. of Chicago Press.

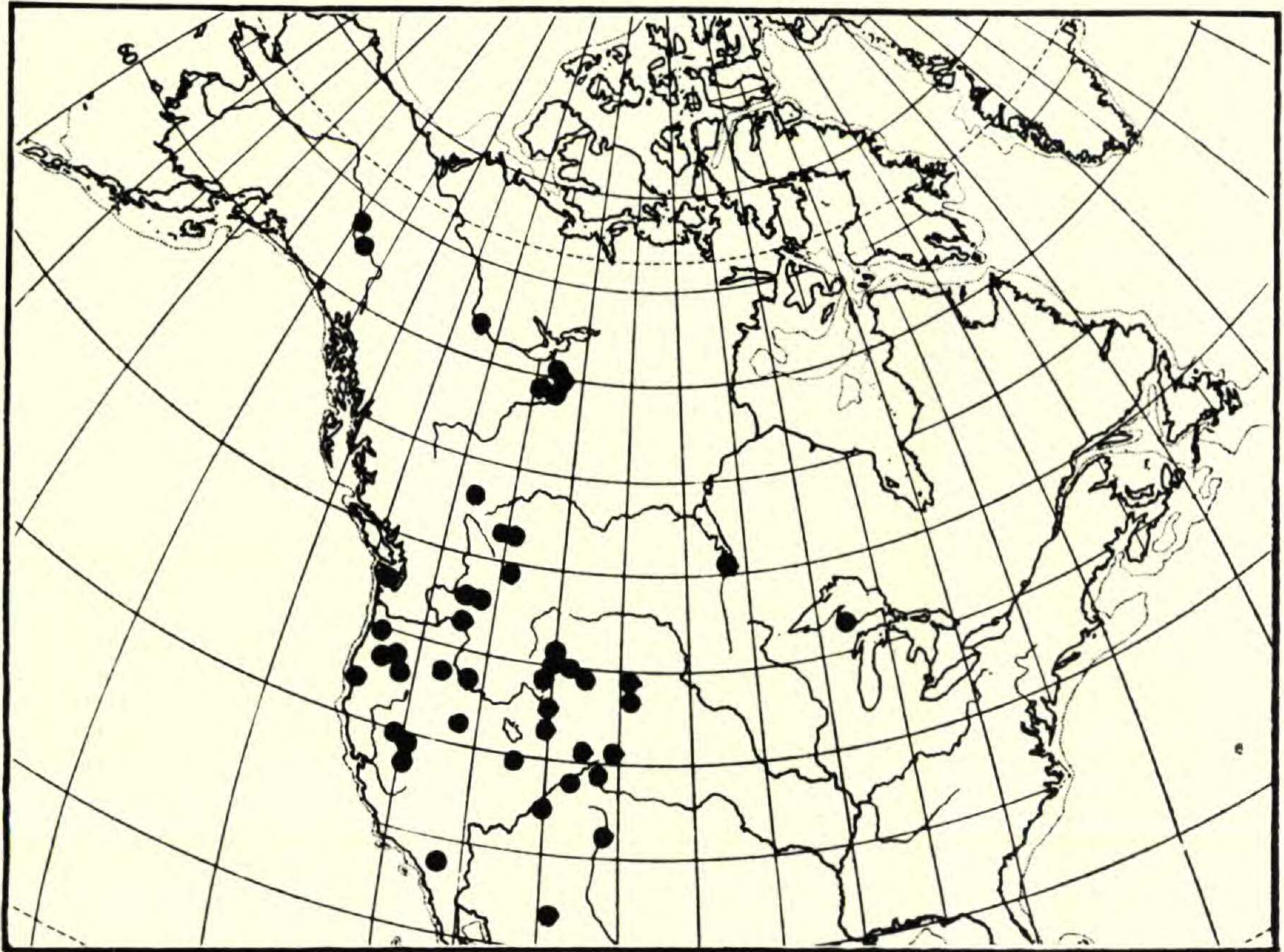
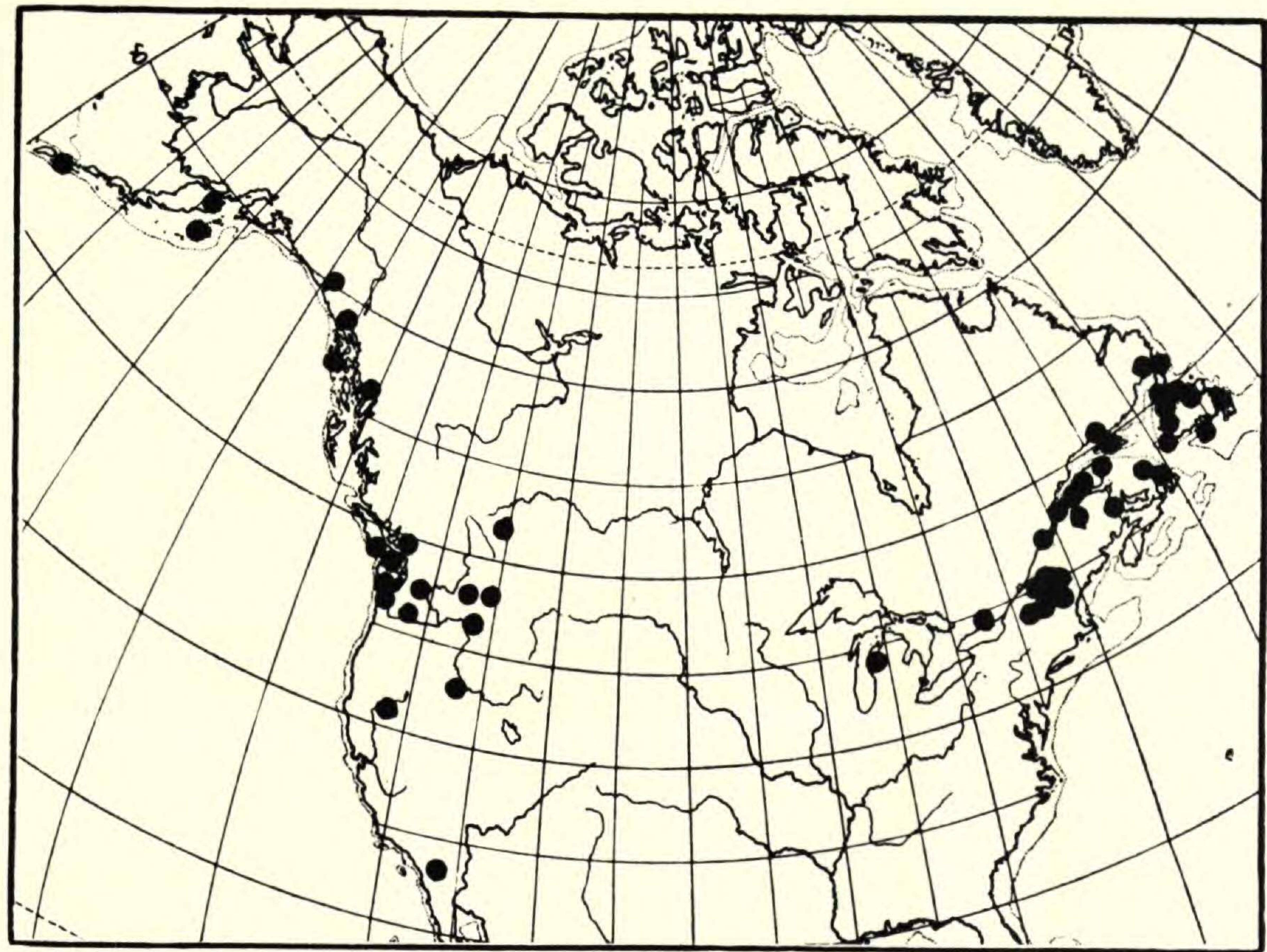


Fig. 1 (upper), Range of *GEUM MACROPHYLLUM*. Fig. 2 (lower), Range of *G. MACROPHYLLUM*, var. *PERINCISUM*.

described by Willdenow from material secured in Kamtchatka, has been found subsequently to be consistent throughout the Canadian forest region of eastern and northwestern North America. It is of interest, however, to find that *G. perincisum* replaces it in the northern and western interior. In view of the fundamental similarity of the latter plant to *G. macrophyllum*, and its geographic relationship, it is proposed that it be considered a geographic variety:

GEUM MACROPHYLLUM Willd., var. **perincisum** (Rydb.), n. comb. *G. perincisum* Rydb. N. Am. Fl. xxii. 405 (1913).

In the Athabasca-Great Slave Lake region the var. *perincisum* is by far the commonest *Geum*. It extends throughout the subarctic Canadian forest district. *G. strictum*, on the other hand, is limited to the semi-open prairie districts and to cabin and settlement clearings, the two places where the more southern elements are to be found in this flora. *G. triflorum* grows on the driest of the semi-open prairies and has a range similar to that of *G. strictum*.

GRAY HERBARIUM,

HARVARD UNIVERSITY.

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